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TO: Natural Resources Board

FROM: Darrell Bazzell – AD/5

SUBJECT: Recommendation to Authorize Public Hearings for Ch. NR 445 Rule Revision Package

Why is the revised rule being proposed?

The revised rule is being proposed to update the list of regulated hazardous air contaminants, emission threshold levels and emission standards. This is the first comprehensive update to the rule since its adoption in 1988. The revised rule is also being proposed to improve the regulatory system by making it easier to understand, reducing the regulatory burden and providing alternative methods for demonstrating compliance.

The development of the proposed rule revisions included an extensive stakeholder involvement process spanning a 30 month period and involving over 40 regular participants at Technical Advisory Group meetings and numerous others on specific issues or intermittently. The TAG and non-TAG efforts resulted in substantive contributions to the rule revisions. New approaches were suggested and proposals were substantially refined through this process.

Updating the Rule to Reflect Current Scientific Knowledge

Ch. NR 445 was adopted in 1988. The list of regulated substances and emission thresholds and standards are based on the scientific knowledge of the mid-1980s. In recognition that knowledge would continue to advance, the rule directed the department to monitor changes in the classifications of hazardous air contaminants and to prepare rule modifications to incorporate these changes. This is the first comprehensive update to the rule since its adoption in 1988.

There are some 80,000 chemicals in use by industry today. About 2800 are considered high production volume chemicals, with over 1 million pounds/year of use. Information on the health effects of these 2800 HPV chemicals is sparse. Some data is available for 50% of the chemicals. Very little, if any, data is available for 43% of the chemicals. The U.S. Environmental Protection Agency estimates that the health effect is known for only about 7% of the chemicals.

As scientific and medical knowledge advances, more and more of these chemicals are found to be harmful to human health. The rule revision proposes to add 153 hazardous air contaminants to NR 445 based on current information about the cancer and non-cancer health effects associated with inhalation exposure. In a few cases, substances that are currently listed in NR 445 have been found to be less harmful to human health than once thought. The rule revision proposes to de-list 5 carcinogens.

Toxicologists are also finding that many of the substances are more harmful to human health than they thought in the mid-1980s. The rule revision proposes to lower the emission standards for 125 of the acute non-cancer hazardous air contaminants and for 5 of the carcinogens currently listed in NR 445. Raised emission standards are proposed for 86 of the currently listed acute non-carcinogens.

More has also been learned about the risk factors associated with carcinogens. In the current rule, most threshold levels for carcinogens were based on whether the substance was classified as a known or probable carcinogen. This classification has no relationship to the substance's potency and resulting public health risk. The rule revision proposes to set risk-based threshold levels for carcinogens.

The proposed additions of hazardous air contaminants to the rule and the revisions to the emission thresholds and standards will provide greater assurance that public health will be protected in Wisconsin.

Revising the Rule to Streamline the Regulatory Process

With 15 years of experience in implementing NR 445, it is clear that opportunities exist to streamline the regulatory process, to make it easier to understand, and to provide sources with more flexibility in terms of how they could meet the emission standards. The revisions to the list of regulated substances added impetus to incorporating innovative regulatory approaches to minimize the impact on sources.

The existing rule is hard to follow. The revised rule eliminates out-dated provisions, consolidates the tables of regulated substances, adds the emission standards to the tables, eliminates redundant language and structures the rule in a more straightforward manner.

The existing rule offers little flexibility to sources with emissions of carcinogens. In some cases this leads to analytical and administrative work that results in minimal, if any, public health benefit. The revised rule offers several alternative approaches that have the potential to substantially reduce the administrative burden as well as compliance costs and to provide better public health protection.

The revised rule reduces the regulatory burden at every phase of the regulatory process. It narrows and places bounds around the initial step of determining whether a source emits a hazardous substance. It streamlines the process for determining whether emissions exceed the regulatory threshold, offers less burdensome compliance demonstration options and avoids the need to re-open permits for most sources.

In addition to benefiting the regulated community, these proposed revisions should lead to improved compliance with the regulation and better public health protection.

Summary of the Revised Rule

The proposed rules contain a comprehensive update to the state's hazardous air pollutant program. This update is intended to bring existing emission standards up to date with current scientific information, add standards, emission inventory and permitting requirements for a number of hazardous substances not currently being regulated, improve the regulatory method of implementing the program by adding compliance flexibility and streamlining administrative requirements. These rules would primarily be implemented in a 3-year time frame. Emission standards for new and modified sources of hazardous air pollutants will need to be met upon startup, while existing sources will have up to 36 months to demonstrate compliance with new requirements.

This proposal also includes a number of new approaches for regulatory sources that attempt to provide:

- clear levels of public health protection (risk based thresholds, risk modeling alternatives)
- regulatory certainty for sources (due diligence, safe harbor)
- reduced regulatory responsibilities for sources unlikely to emit hazardous air pollutants (incidental emitters)
- better tools to enable the department to require corrective action on a case-by-case basis (backstop)

Furthermore these rules propose:

- to establish special studies for sources of emissions of silica and wood dusts;
- to set procedures for listing, de-listing and modifying requirements for hazardous air pollutants in the future; and
- to clarify the relationship between the state and federal hazardous air pollutant programs.

Finally, this proposal contains a non-controversial change that is not directly related to the state's hazardous air pollutant program, related to repealing an out-of-date volatile organic compound emission standard.

The comprehensive nature of this update presents a unique transitional challenge. Sources will need time to identify and track newly regulated pollutants prior to those pollutants being included in annual emissions reports and applications for operation permits. Additionally, sources currently regulated under the state's hazardous air pollutant program will need to continue to meet existing standards until such a time that they certify compliance with the new standards and requirements proposed in this rulemaking. Under this proposal, the transition should take approximately 36 months based on the allowed compliance schedule for existing sources.

In order to ensure an orderly transition, the revised ch. NR 445 is divided into three subchapters. The first subchapter will contain rule applicability, definitions and general limitation language. The second subchapter will retain the five tables of hazardous air pollutants, emission standards and compliance requirements that exist today. The third subchapter will contain language for the new pollutants, standards, compliance requirements and schedules, special studies, procedures for future updates, variance provisions and spills reporting.

The transition for hazardous air pollutant related requirements in chs. NR 407 and 438 will be addressed by creating new tables in each chapter containing the expanded list of pollutants and new threshold levels. New language will clearly identify when new requirements will need to be met.

It is anticipated that a future rulemaking will be proposed to remove obsolete language and tables in these three chapters after the transitional period.

Control of Hazardous Air Pollutants

Emission Standards

The approach used to establish emission standards for hazardous air pollutants would not change under this proposal. Currently, standards are set two ways. Standards for substances that have acute or chronic non-carcinogenic health effects are set by establishing short term (1 hour or 24 hour) and long term (annual) ambient air concentrations. Each facility regulated under these standards is allowed to emit up to that amount. Standards for carcinogenic substances are set by establishing source specific control technology requirements to a level that is either best available control technology (BACT) or lowest achievable emission rate (LAER). This approach seeks to reduce the public exposure to carcinogens to the lowest level possible while considering the feasibility and costs of controls to the source.

Stack thresholds are emissions rates set in rule for hazardous air pollutants released at different heights and act as regulatory "filters" in the current program. If a facility is either not physically able to emit at or

above these rates, or can take operational limitations to stay below these rates, nothing further is required to demonstrate that emission standards are met. Currently, there are two stack categories for acute and chronic non-carcinogenic hazardous air pollutants based on above and below 25 foot release heights and one category for carcinogenic hazardous air pollutants for an entire facility.

Under the proposal, stack thresholds would be established for four categories. Emissions released from stacks below 25 feet, between 25 and 40 feet, between 40 and 75 feet, and above 75 feet. The addition of stack thresholds should reduce the regulatory burden for a number of sources not capable of emitting hazardous air pollutants above a level of concern.

The method used to establish regulatory thresholds for carcinogenic substances would change under this proposal to one based on the potency of the substance rather than the current method based on a substance's classification as either a known or probable human carcinogen. This change is being proposed as a more scientific basis for setting threshold levels and providing better public health protection.

Compliance Requirements

The new stack threshold proposal also provides the basis for introducing innovative compliance options for sources emitting carcinogenic substances. These changes are expected to provide compliance flexibility without compromising human health protection and will better focus internal and external resources on sources of greater environmental significance.

Introduction of compliance options is a proposed departure from the department's current approach that once a facility emits a carcinogen over the threshold rate it is required to meet source specific control technology requirements. With the establishment of risk-based thresholds, a facility would now have additional options available as alternates to control requirements:

- the use of product substitution or operational controls to limit emissions below threshold rates;
- air dispersion modeling to show that public exposure is less than 1-in-1,000,000 additional lifetime cancer risk for an individual carcinogen;
- air dispersion modeling to show that public exposure is less than 1-in-100,000 additional lifetime cancer risk for all carcinogens;
- any combination of product substitution, operational controls and risk showing described above.

All other compliance methods currently available to sources under existing requirements would continue to be available under this proposal. Significant to this proposal is that sources currently meeting specific BACT or LAER requirements for a carcinogenic hazardous air pollutant under the existing rule will not have to re-evaluate or meet new requirements for that pollutant under the revised rules if the classification for the pollutant does not change.

Alternative compliance methods are also proposed for two areas that previously were unregulated for hazardous air pollutants; particulate emissions from non-mobile internal combustion engines and outdoor fugitive emissions of coal dust.

- *Diesel Engines*

Under the proposal, internal combustion engines burning fuel oil (i.e., diesel fuel oil), would need to meet new fuel specifications and control requirements. A requirement that all non-mobile internal combustion

engines use on-road, rather than off-road, fuel oil would become effective six months after the effective date of the rule. New and modified engines, and facilities testing equipment using these engines and combusting greater than 40,000 gallons of fuel a year, would need to meet best available control technology (BACT) requirements to reduce particulate emissions upon start-up. Existing engines and facilities would need to use retrofit technology to reduce particulate emissions by using certified control equipment. Sources subject to the BACT requirements would need to obtain permits, while those required to use certified controls would not.

- *Coal Dust*

Requirements to demonstrate compliance with ambient standards for coal dust emissions are being proposed for facilities emitting greater than threshold amounts. Compliance with the standard would be demonstrated three ways. Similar to other sources of acute, non-carcinogenic hazardous air pollutants, a showing could be made through an air dispersion model that emissions would not exceed an off site standard. New under this proposal, and limited to coal dust sources, is the ability to demonstrate through the use of ambient monitors, either at the facility, or as part of a larger sector specific monitoring effort, that dust mitigation efforts are adequate to meet the proposed standard. It is also proposed that facilities not able to demonstrate compliance using these methods would have the ability to request a variance from the proposed standard. The variance would use the same procedure that currently exists in rules to set alternative emission standards for hazardous air pollutants with reference concentrations.

New Approaches and Concepts

Due Diligence / Safe Harbor

One area that the revised rules attempt to better clarify is the level of effort expected from sources to investigate whether they emit any NR 445 hazardous air pollutants at levels that exceed the regulatory threshold. Currently, regulations are silent on what constitutes a reasonable search and inquiry. This potentially leads to expenditures of resources by sources beyond what is needed, in order to establish that every effort has been made to show compliance with requirements. Under the proposal, this effort is better clarified through a definition of due diligence that allows owners and operators of sources to rely on their best professional judgment in determining which, and in what amounts, hazardous air pollutants are released from a source. An accompanying proposal establishes a safe harbor for owners or operators that exercise due diligence. Under safe harbor, retrospective enforcement will be not taken by the Department if additional hazardous air pollutants, or emissions in a greater amount, are later identified, provided the source acts in a timely fashion to comply with all applicable requirements.

The hazardous air pollutant regulations differ from the criteria pollutant regulations in significant ways that justify the inclusion of the due diligence/safe harbor provisions in NR 445. These include the number of hazardous air pollutants listed in NR 445; the threshold levels, which for some are very low; the different ways in which the chemicals may be formed as part of a combustion or manufacturing process; and, the properties of the chemicals, which affect the potential for air emissions.

Source of Incidental Emissions

The proposal attempts to minimize the impact of the new rules by establishing limited requirements on owners and operators of sources that are not expected to have emissions of hazardous air pollutants. This expectation is met in two ways. The first is by virtue of the type of primary business the source is engaged in. The second is by virtue of the small amount of particulate matter (PM) or volatile organic

compounds (VOC) they emit. A source is considered to be an incidental emitter if it is either described by one of the Standard Industrial Classification codes listed in the rule, or has actual, annual emissions of less than both three tons VOC and five tons PM. These sources may limit their search and inquiry to hazardous air pollutants emitted from processes identified by rule and a subset (78) of the entire list of substances. If the source has emissions of a hazardous air pollutant greater than its respective threshold value, it will have to meet all of the requirements under the proposal but only for the pollutant and process identified under the limited search and inquiry.

Backstop Authority

While many of the proposals described above can reduce the administrative burden for a great number of sources, it also creates the potential that a very small number of sources that should be regulated under NR 445 are inadvertently excluded from regulation. To address possible oversights without imposing unnecessary regulations on the majority of sources, language describing the Department's "backstop" authority is included in this proposal. This authority would be used to regulate sources that correctly follow procedures and fall out of the regulatory system, but due to circumstances that are not foreseeable, or are rarely encountered, pose a concern to public health. These sources would be held to the same emissions standards as they would otherwise have been. In order to avoid penalizing these sources inappropriately, the proposal would allow the source the longer of the balance of any existing compliance schedule related to the hazardous air pollutant, 90 days, or a longer timeframe with written approval from the Department.

Special Studies

Special studies are being proposed for a number of forms of silica and wood dust. The purpose of these studies would be to determine whether existing regulations of particulate matter are adequate to protect public health from these substances, and if not, determine the most appropriate way to minimize the public health impact. Emissions of silica and wood dust occur from a great number of industries and industrial activities that require additional evaluation outside of this rulemaking effort. While silica and wood dust are listed in the hazardous air pollutant tables in this proposal, no regulatory requirements for sources of these emissions are being proposed.

Hazardous Air Pollutant Listing / Future Updates

Specific procedures are proposed to set both the frequency and process to update the state's hazardous air pollutant program in the future. It is proposed that every three years scientific information from national and international agencies be reviewed to identify changes in the basis used previously to list substances in rule and to develop a list of new substances to consider for listing as hazardous air pollutants in the future. Every six years, in addition to the review of available scientific information a determination would be made on which of the new substances should be listed in administrative rules as hazardous air pollutants as well as changes needed for existing hazardous air pollutants. Both the three and six year reviews and the determination would be done in consultation with the Department of Health and Family Services. The three-year updates and recommendations on rule modifications would be made in reports to the natural resources board. Criteria to determine whether to list or de-list substances for regulation in NR 445 as hazardous air pollutants are also included in this proposal.

Relationship between State and Federal Hazardous Air Pollutant Programs

A major change to the applicability language in ch. NR 445 is proposed in this rulemaking. This change is being proposed to better clarify the relationship between the state and federal hazardous air pollutant programs as dictated by 285.27(2)(a), Wis. Stats., and to avoid unnecessary overlap between the two programs. This clarification is necessary due to the diversity and complexity of new federal emission standards promulgated in the last few years and those expected to come in the future. Essentially, state statutes prohibit the Department from imposing more restrictive emission standards on a source of a hazardous air pollutant that is subject to an emission standard promulgated under sec. 112 of the Clean Air Act.

However, due to the differences in the approach the two programs take in regulating hazardous air pollutants, and the specific pollutants covered by each regulation, determining where one program ends and the other starts can be difficult. In order to make this determination one needs to take into account the physical characteristics of the pollutant, as well as, processes, activities and emissions regulated by the federal program as compared to those regulated by the state program. The proposed changes are intended to clarify that these specifics need to be considered in applying the state requirements. The following examples may help illustrate the relationship.

- If the federal standard applies to specific emissions units at major sources of federal hazardous air pollutants, then the state standard for the HAP can apply to emissions units at the major source not regulated by the federal standard. Furthermore, the state standard can apply to all emission units at non-major sources. A major source has potential emissions greater than 10 tons of a Clean Air Act HAP, or greater than 25 tons of all CAA HAPs combined.
- If the federal standard applies to emissions of a species of hazardous air pollutant, e.g., a volatile organic compound, and the federal requirement reduces emissions of all volatile hazardous air pollutants from an emissions unit, then none of the state standards for any of the volatile hazardous air pollutants on the state list would apply to that emissions unit. Conversely, the state standard would apply to any/all non-volatile hazardous air pollutants being emitted from the emissions unit regulated under the federal standard.
- If a federal standard is expressed as a single pollutant chosen as a surrogate for a type or species of hazardous air pollutant, it will be considered to apply to all hazardous air pollutants on the state list of the same type or species. As in the previous example, state standards for hazardous air pollutants of a different type or species than that represented by the surrogate pollutant can apply to an emission unit regulated under the federal standard.

This proposal also includes deleting the current rule language that requires a source to continue to meet a state hazardous air pollutant standard in place prior to an applicable federal standard for the hazardous air pollutant coming into effect. This language was included in the 1994 revision to ch. NR 445 and reflected language in federal rules intended to ensure that implementation of federal hazardous air pollutant standards did not erode the environmental gains made through state programs. At that time, most of the sources in Wisconsin had already complied with the provisions in ch. NR 445 while only a limited number of federal standards had applicability in Wisconsin.

The proposed deletion is necessary to avoid the significant administrative complication that would be created for both regulated sources and the Department of having to track effective dates for each

individual hazardous air pollutant in the existing and proposed rule and for each industrial emissions unit in the 170 industrial source categories regulated under the federal program today.

Furthermore, it is expected that all of the federal standards for the industrial source categories will be promulgated within the 36-month schedule for sources to certify compliance with new state standards and requirements. This will allow for a much better understanding of how the state and federal programs relate to each other, and due to the clarity provided for state applicability, lead to implementation of both programs without unnecessary overlap.

Streamlining

In addition to the provisions already described, the revised rules include a number of other efforts to reduce unnecessary regulatory burden and streamline current requirements. Examples include:

- New rule language structured to allow readers to better understand requirements and obligations.
- Consolidated hazardous air pollutant tables that include emission thresholds, standards and averaging times for each pollutant in one location.
- Limited applicability table for hazardous air pollutants classified as pharmaceuticals that reduces the list of hazardous air pollutants for the majority of sources.
- Clarification on how to perform emission calculations.
- Allowing the use of screen models in appropriate situations to reduce the complexity of the compliance determination.

Other Air Program Areas Affected under the Proposal

In addition to emission standards, the state's hazardous air pollutant program contains annual inventory and permit requirements. Proposed changes to these program areas are needed to successfully implement the revisions to emission standards and control requirements; advance efforts to streamline existing requirements; and incorporate new concepts such as due diligence, safe harbor and limiting regulatory impact to sources of incidental emissions.

Emission Inventory

The requirement to report actual emissions to the air emissions inventory will be one of the first requirements to become effective for existing sources. Starting the first full calendar year after the rule becomes effective, owners and operators will have to begin reporting annual, actual emissions of the new substances if they are emitted above threshold levels. Reporting threshold for many of the existing substances are proposed to be lowered, requiring some sources which have not previously been required to report, to begin submitting annual reports. For purposes of reporting NR 445 substances, sources of incidental emissions will have reporting requirements limited to specific processes and hazardous air pollutants identified during their search and inquiry. This will reduce their administrative burden.

Construction Permits

Currently, modifying an existing source or constructing a new source that results in emissions of a new hazardous air pollutant, or increased emissions above threshold amounts, is subject to new source review. The proposed rules attempt to minimize the need for construction permits in two areas. One is due to the additions of new hazardous air pollutants and reduced thresholds for existing hazardous air pollutants. The other is where a source's compliance obligations are either minimal or straightforward. In these

cases, it is proposed that the owner or operator be able to certify compliance with new emission standards, rather than undergo a permit review prior to initiating a new project. Projects which modify existing sources or construct new emission sources of a carcinogenic substance which need to meet source specific control technology are the only situations that will require new source review and a construction permit due to the changes in this proposed rule package.

Operation Permits

The impact on the operation permit program is also being minimized in a similar fashion as the construction permit program. Under the proposal, owner and operators, with the exception of those needing to meet source specific control technology requirements for sources of carcinogenic substances will be able to certify compliance with the requirements. Insertion into operation permits of operational controls or recordkeeping requirements needed to assure compliance with a new standard would be delayed until the permit is next re-opened. Permit re-openings occur on a five years basis.

Additional Items Included in the Rule Proposal

The proposal also contains one non-controversial administrative change unrelated to the hazardous air pollutant program. Perchloroethylene, once thought to contribute to the formation of ozone, is proposed to be included in the list of substances that are not considered to be volatile organic compounds. As a result, an existing emission standard, related to the control of ozone from sources of perchloroethylene, is proposed to be repealed. Implementing this change had been previously delayed due to the public's concern with emissions of perchloroethylene, which is now acknowledged to be a carcinogenic substance and is proposed to be listed in NR 445. Sources that emit above newly proposed NR 445 thresholds will be required to meet the control requirement emission standards under the hazardous air pollutant program.

Chronology of Key Events in the Proposed Rule

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| Effective date of rule revision | <ul style="list-style-type: none"> • New and modified sources must meet new requirements. |
| During year 1 | <ul style="list-style-type: none"> • Special studies for silica and wood dust are initiated. • Internal combustion engines must burn on-road fuel oil. |
| 2 years after effective date | <ul style="list-style-type: none"> • Emission inventory reporting for new list for prior calendar year • Progress report on silica and wood dust special studies are submitted to NRB. |
| 3 years after effective date | <ul style="list-style-type: none"> • Compliance certifications for existing sources must be completed. • Report on review of new scientific information submitted to NRB. |
| 6 years after effective date | <ul style="list-style-type: none"> • Report on review of new scientific information with recommendations for rule modifications submitted to NRB. |
| No later than 8 years after effective date | <ul style="list-style-type: none"> • Operation permit renewal incorporating NR 445 compliance requirements completed. |

How does the revised rule affect existing policy?

The proposed rule revisions are not a major departure from existing policy, which is to protect public health and welfare from inhalation exposure to hazardous air pollutants that are emitted by a stationary source. The proposed revisions do not change any of the basic policies that form the framework for NR 445. However, they do introduce some new concepts and more clearly articulate some of the existing policies.

The rule revisions maintain the public policy foundation of NR 445.

- The objective continues to be to prevent future problems from occurring rather than correcting them after the fact.
- The focus continues to be on inhalation exposure only and is not expanded to include other exposure pathways.
- The regulatory target continues to be to ensure that emissions from each individual facility meet the emissions standards at the property line; the cumulative impact of emissions from multiple facilities is not regulated.
- The methodology for setting emission standards is not changed. The standards continue to be expressed as ambient air concentration standards for both the acute and chronic non-carcinogens and as control technology requirements for the carcinogens.

Policies that are more clearly articulated in the proposed revisions include:

- The two-step process for determining to list a substance as a hazardous air contaminant in NR 445.
- The process for updating the list of regulated substances.
- The interface between NR 445 and the federal hazardous air pollutant program under Section 112 of the Clean Air Act.

New concepts that are introduced include:

- Setting risk-based threshold levels for carcinogens (but not changing the emission standard).
- Establishing an abbreviated regulatory process for sources that are expected to have minimal, if any, emissions of hazardous air contaminants.
- Introducing the concepts of due diligence and safe harbor protection to clarify expectations and responsibilities for the identification and quantification of NR 445 substances.
- Piloting an Environmental Management System approach as an option for demonstrating compliance with a control technology standard.
- Including risk-based compliance demonstration alternatives to the technology-based compliance requirement for emissions of carcinogens.
- Allowing facilities to self-certify their compliance with NR 445 requirements rather than re-opening operation permits or obtaining construction permits (except for sources needing to comply with control requirements for carcinogens).

Has the Board dealt with these issues before?

Wisconsin's hazardous air pollutant rules were the result of extensive public involvement, starting in the early 1980s. At that time there was interest in establishing hazardous air pollutant limits for two chemicals: 1,1,1-Trichloroethane (also known as methyl chloroform) and methylene chloride (also known as dichloromethane). During this period, there was concern in Wisconsin about the health effects of toxic air releases and a concern about the lack of policy and regulations of hazardous air pollutants at the federal level.

In response to this concern, a 7-member group of scientists, industry, and governmental representatives called the Hazardous Emissions Task Force was appointed in May 1983 and the group was given the following tasks:

- Recommend a definition for a toxic and/or hazardous air emission.
- Recommend a methodology (standard setting process) to be established in rulemaking for establishing emission limits to adequately protect public health and welfare.
- Examine potential health impacts surrounding the use of 1,1,1-trichloroethane and methylene chloride and make recommendations as to the adequacy of existing regulations applied to these compounds.
- Recommend which sources of hazardous emissions should be exempt from permit requirements because the potential emissions would not pose a significant threat to public health, safety or welfare.

The Hazardous Emissions Task Force, on a vote of 5 to 2, made its report of recommendations in July of 1985. The report stated that the authors did not presuppose the existence or absence of a hazardous air contaminant problem in Wisconsin, but made their recommendations “with an eye toward prevention of such problems”. Department staff then began development of Wisconsin’s hazardous air pollutant rules and requirements. Staff held numerous public informational meetings and public hearings on a rule that incorporated the findings of the task force. After much debate and controversy, the hazardous air pollutant requirements, ch. NR 445, Wis. Adm. Code, became effective in October 1988.

The hazardous air pollutant requirements have been controversial since their adoption. For example, not long after ch. NR 445 was adopted, it was challenged by a group of 23 manufacturers, industry trade groups, the Wisconsin Hospital Association and Shawano Community Hospital. In May of 1990, the State Appeals Court upheld the Department's authority to establish hazardous air pollutant emissions limitations on Wisconsin sources to protect public health.

Also in 1990, a required report to consider appropriate emissions limitations on chemicals in Table 4 of ch. NR 445 met with considerable controversy with the proposal to introduce chronic non-cancer toxicity based limits, called reference concentrations, into the rule. As a result of the controversy, the DNR board delayed action on the incorporation of reference concentrations into the rule in September of 1991. The Board then directed Department staff to work with affected industry on a proposal that incorporated reference concentrations but also addressed industry concerns about using the reference concentrations for establishing regulatory limits. After numerous meetings and public hearings in the spring of 1994, the Natural Resources Board adopted a revised rule incorporating reference concentrations in August 1994. The use of reference concentrations in the rule became effective in January 1995.

Who will be impacted by the proposed rule revisions? How?

The two primary goals of the rule revision are to update the rule to reflect current scientific knowledge and to streamline the existing regulatory process. The revisions to the list of regulated substances add to the regulatory responsibilities of industry; the revisions to streamline the regulatory process reduce the regulatory burden.

An NR 445 Technical Advisory Group (TAG) was established in 2000 to advise the Air Program on the development of the rule revision. A subgroup of the TAG, the Business Impact Working Group, was formed to assist the Bureau and the TAG assess the impact to industry of the proposed rule revisions. Members of the NR 445 TAG were invited to participate. Members included: Wisconsin Manufacturers and Commerce (WMC), the Department of Commerce’s Small Business Clean Air Act Assistance

Program, University of Wisconsin-Extension Solid and Hazardous Waste Education Center (SHWEC), Wisconsin Paper Council, and Wisconsin Transportation Builders Association among others.

Who is Likely to be Impacted by the Proposed Revisions to the List of Regulated Substances?

The Business Impact Working Group spent the first several months researching the question of which industries or industrial processes are likely to be impacted by the proposed revisions to the list of regulated hazardous air contaminants. This task was difficult for a number of reasons.

- There is no readily available source of comprehensive information linking chemicals, industrial processes and air emissions.
- Industry does not report emissions of non-regulated substances to the state or federal governments.
- Chemicals used in or created during the manufacturing or other processes do not always result in air emissions. The properties of the chemical or the way in which it is used may preclude air emissions. For example, a chemical may be bound in a matrix or found in a mixture with other substances, minimizing its potential for emission.

Two strategies were followed to answer the question. The first was to solicit information from Wisconsin industry. The second was to review available data and apply expert judgment.

Soliciting Information from Wisconsin Industry

A concerted effort was made to widely disseminate the proposed lists of regulated hazardous air contaminants and to solicit information from industry. The proposed revised list of chemicals, including threshold levels and emission standards, has been available on the Internet for over two years, has been distributed to all TAG members as well as the members of the Air Toxics Committee, and has been distributed at workshops and seminars throughout the state. In addition, the trade association members of the TAG have made the information available to their membership. The department distributed over 2,000 copies of the list. In addition, the Bureau requested voluntary reporting of emissions of the proposed new chemicals as part of the year 2000 annual emissions inventory reporting, but received very few responses.

Nevertheless, through these efforts, several substances proposed as additions to the list were identified as having a significant regulatory impact. These included: silica, respirable wood dust, respirable coal dust, asphalt fume, diesel exhaust emissions and several low toxicity chemicals.

- Silica and wood dust have the potential to be emitted by sources in many industries, including wood products, pulp and paper, foundries, sand and gravel quarries, and transportation construction. Because of the diversity of emission sources and the complexity of the issues related to these substances, special studies are proposed for these two substances and there is no regulatory impact from the proposed rule revisions.
- The addition of respirable coal dust has the potential to impact coal distributors, electric utilities, state-owned facilities, paper companies and other sources that handle coal. This is discussed in the section on Potential Controversies.
- Listing asphalt fumes has the potential to impact asphalt plants and the transportation construction industry. After considerable study, the decision was made to not list asphalt fume because the substances of concern in asphalt fumes are regulated under NR 445.

- The low toxicity chemicals are not being listed in NR 445 but a mechanism is being created to monitor emissions and regulate on a case-by-case basis in the event that emissions were to reach a level that exceeds the ambient air concentration. This is unlikely to occur and there is expected to be no regulatory impact.
- The addition of diesel exhaust particulate has the potential to impact the electric utility industry, transportation construction and establishments in all sectors that use diesel generators to provide power. The greatest impact will likely be on those establishments that use stationary diesel generators over a certain threshold level. However, the regulatory impact on portable generators, such as are commonly used by the transportation construction industry, will be limited to requiring the use of cleaner, on-road diesel fuel. The proposed regulation of diesel generators is discussed in the section on Potential Controversies.

Review of Available Data and Expert Judgment.

The data analysis study included an analysis of the literature and database reviews, and the application of expert judgment. This analysis focused on approximately 165 chemicals that are either proposed to be added to the list of regulated substances or are already listed but whose emission standards or thresholds are proposed to be significantly lowered.

The overall conclusion of the Working Group analysis is that the industrial sectors most likely to emit one or more of the 165 chemicals include: printing and publishing, pulp and paper, foundries, wood products, chemical manufacturing, coating and engraving, food processing, and metal working. These sectors are already regulated for their emissions of criteria pollutants or hazardous air pollutants or both. However, certain companies may need to control or further reduce emissions of already regulated NR 445 substances or reduce emissions of currently unregulated substances.

The following provides more specifics on the findings of the different analyses.

- *Analysis of the Industrial Use of the Chemicals, Primarily as Raw Material or Feedstock.*

Through a collaborative effort of Kestrel Management Services (a consultant hired by WMC), UW-SHWEC, the Department of Commerce and the Bureau Air Management, the 165 chemicals were analyzed to identify the processes or industries that were most likely to use the chemicals and then to assess the likelihood that these processes or industries would be found in Wisconsin. For the most part, this analysis identified processes or industries in which the chemical is used primarily as a feedstock or raw material.

Based on this analysis, it is estimated that about a third of these 165 chemicals are likely to be found in Wisconsin, about a third are moderately likely to be found and about a third are unlikely to be found. As noted earlier, the use of a chemical does not always result in air emissions.

- *Analysis of the Industrial Use of Products Containing the Chemicals*

UW-SHWEC then analyzed the 165 chemicals to assess the extent to which they may be contained in products used by industry, how these products might be used by industry and the potential for air emissions to result from the normal use of these products. SHWEC's analysis included a search of a Material Safety Data Sheet (MSDS) database of over 250,000 products.

Based on this analysis, SHWEC estimates that 145 chemicals analyzed were unlikely to present an air emission impact from the industrial use of products for one of the following reasons:

- They are primarily a feedstock or raw material, rather than contained in an intermediate product and are therefore not listed in an MSDS sheet.
- Their chemical properties and/or use by industry make a resulting air emission unlikely.
- They are not contained in products used in the manufacturing industry. Examples include pesticides and pharmaceuticals.

SHWEC estimates that 20 of the 165 chemicals have the potential to be emitted as a result of industrial use of products containing the listed chemicals. The chemicals were grouped into three groupings:

- Welding Compounds
- Solvents, Coatings and Blowing Agents
- Commonly Used Chemicals and Compounds.

How Will Sources Likely be Impacted by the Proposed Rule Revisions to the Regulatory Requirements?

One of the primary objectives of the rule revisions is to reduce the regulatory burden, with particular emphasis on reducing the administrative burden and providing sources with more flexibility in terms of how they meet the standards. The first section of this discussion describes the regulatory reduction proposals. The second section describes the findings of workshops and interviews conducted by WMC and the Wisconsin Department of Commerce Small Business Clean Air Assistance Program.

Rule Revision Proposals to Reduce the Regulatory Burden

The state's hazardous air pollutant regulatory system was mapped out and analyzed from a systems perspective. Each regulatory activity within the system was reviewed to determine whether it could be eliminated, simplified, revised to minimize administrative requirements, or improved by providing more flexibility to sources. This led to numerous enhancements. Among these are:

- The incidental emitters concept
- Due diligence/safe harbor/corrective action
- The inclusion of threshold levels for four different stack heights
- Modeling "off-ramp" for all regulated substances and modeling compliance demonstration options for carcinogens
- Limited applicability tables for specific classifications of substances
- Self-certification for compliance
- Pilot program to use environmental management systems (EMS) as a compliance tool

Determining Whether a Source Emits a Hazardous Air Contaminant.

The first step in the regulatory process is determining whether a source emits one or more of the substances listed in NR 445. Many see this as imposing the most significant administrative costs associated with the rule revision. First, it has wide-sweeping applicability since the rule applies to any stationary source that may emit a hazardous air contaminant. Second, the level of effort needed to review the entire list of substances is considerable, if the expectation is that an exhaustive search is required.

Considerable time and effort was spent by the TAG and staff to develop measures that would substantially reduce the regulatory impact of the rule at this step. The effect of these measures is to direct

resources and attention to the most likely emission sources, to simplify the process and to eliminate unnecessary work that is likely to result in minimal, if any, environmental benefit.

- *Incidental Emitters.*

The rule revision narrows the scope of the rule by establishing an “incidental emitters” category and limiting the compliance requirements to certain processes and chemicals of special concern. The “incidental emitter” category includes most non-manufacturing sectors and manufacturers that emit less than 3 tons/year of volatile organic compounds and less than 5 tons/year of particulate matter. This has the effect of reducing the potential scope of the regulatory impact from about 260,000 establishments in Wisconsin to about 1,500 establishments. It is estimated that close to 99% of all Wisconsin establishments will fall into the “incidental emitter” category, including over 90% of manufacturing establishments.

- *Limited Applicability Tables.*

Over 100 of the 577 hazardous air contaminants listed in NR 445 will have limited applicability. This automatically eliminates these substances from consideration by all but a few facilities in Wisconsin. The two limited applicability tables will have a regulatory impact only on facilities that manufacture, treat or dispose of either pharmaceuticals or of pesticides, insecticides and other similar substances. There are very few of these facilities in Wisconsin.

- *Due Diligence/Safe Harbor/Corrective Action.*

The rule revisions place bounds on the scope of the search and inquiry process. The rule explicitly states that the responsibility of an owner/operator of a source is to exercise due diligence by investigating likely sources of emissions rather than conducting an exhaustive search of all the substances listed in NR 445 and “proving the negative”. The rule revisions also include “safe harbor” language that provides sources with the assurance that if they exercise due diligence and meet compliance requirements for any NR 445 substances identified, they will not be held legally liable if it is later found that they emit an NR 445 substance over threshold levels. They will be required to come into compliance in a timely manner, but they will not be retrospectively penalized. This measure focuses time and effort on the most likely potential emission sources and provides an incentive to conduct a meaningful search.

Determining Whether Emissions Exceed Threshold Levels

For sources that emit a NR 445 substance, the second step of the process is to determine whether the emissions exceed emission rates established as thresholds in the pollutant tables. If they don’t, then no further action is required. If emissions exceed threshold levels, then further action is required.

The rule revisions include a number of new provisions that make it easier for sources to demonstrate that their emissions do not exceed threshold levels. These measures will greatly reduce the administrative burden for many sources at this step and will increase the number of sources able to make this demonstration; thus avoiding NR 445 related regulatory requirements and compliance costs. These measures apply across the board to all substances listed in NR 445, not just those that are being added or revised.

- *Four Stack Threshold Levels.*

One change that significantly reduces the administrative burden is the creation of four threshold levels based on stack heights: under 25 foot; 25 to 40 foot, 40 foot to 75 foot and over 75 foot stacks. Currently, there are two threshold levels for non-carcinogens, under 25 foot stacks and over 25-foot stacks, and a single threshold level for carcinogens. The revised threshold levels are set such that emissions below those levels will not pose a health hazard to the public.

An example helps illustrate the significance of this revision. Benzene is a known carcinogen. Currently, the NR 445 threshold level is 300 pounds/year of emissions from the entire facility, regardless of the stack height. According to the 1999 Air Emissions Inventory, 36 facilities in the foundry industry reported over 300 pounds of benzene emissions and are subject to the “Lowest Achievable Emission Rate” control requirement (LAER) or a LAER variance. A staff analysis of these facilities estimates that the benzene emissions from 80% of these facilities will fall below the stack threshold levels for benzene under the revised revisions. These facilities will not have NR 445 regulatory requirements related to benzene.

Complying With Emission Standards

Sources whose emissions exceed threshold levels must demonstrate compliance with the emission standards.

- *Modeling Demonstration Options.*

Demonstrating, through air dispersion modeling, that emissions do not exceed an ambient air standard is the most commonly used method to show compliance for non-carcinogens. The rule revisions include several modeling options that allow sources to demonstrate through source-specific modeling that their emissions, although greater than table thresholds, would not exceed ambient standards or specific risk levels. Modeling options are not currently available for the carcinogens under the existing rule and had the potential to be more complex for non-carcinogens.

These modeling options include:

- The modeling “off-ramp” – an easy to use screen model to demonstrate that emissions do not exceed ambient standards or specific risk levels
- Demonstration that total facility wide emissions of all carcinogens do not exceed the 1 in 100,000 risk level
- Demonstration that total emissions of a particular carcinogen do not exceed a 1 in a million risk level

- *Alternatives to BACT/LAER*

Currently, sources with emissions of non-carcinogens can opt to take operational restrictions (e.g., hours operated each day or process rates) to limit their emissions as an alternative to installing pollution control equipment. However, this option is not available to sources with emissions of carcinogens. These sources must perform a BACT or LAER analysis. This is a rigorous engineering analysis that usually entails hiring a consulting engineer and frequently involves consultations with Air Management staff. Industry and air permit engineers have identified it as a regulatory hurdle that is costly, time-consuming, does not always result in the most cost effective solution and sometimes results in minimal or no environmental benefit.

The proposed revisions include several alternatives to BACT/LAER analyses that will reduce the regulatory burden and will be as, if not more, protective of public health. These allow the owner/operator to make changes within the facility or take operational limits such that the emission concentrations off-site of a particular carcinogen or of all carcinogens do not pose an unacceptable risk to public health. These options reduce the regulatory burden in three ways.

First, they shift the analysis from a prescriptive, narrowly focused and potentially expensive BACT/LAER analysis to an analysis that examines the most cost-effective means of reducing public health risk exposure. Often, the analysis may be simple and straightforward, as is frequently the case with the non-carcinogens, and may not require a detailed engineering analysis.

Second, the compliance solution may be less costly than the BACT/LAER solution would have been, e.g., taking a reasonable limit on hours of operation or throughput versus installing pollution control equipment.

Third, it provides a mechanism for sources with known carcinogens to avoid the LAER variance process by adopting other compliance methods that still are health protective.

Permit Process

Sources with potential emissions over the permitting thresholds will need to comply with NR 406 (construction permits) and NR 407 (operation permits). The rule revisions include two provisions to minimize the administrative burden associated with the permit process.

- *Compliance Certifications.*

The proposed rule revisions create a streamlined compliance certification process to minimize the additional administrative burden associated with the permitting process. With the exception of sources needing BACT/LAER approvals, sources will be able to certify compliance by submitting information describing their emissions, how they are meeting the standard and the records they are keeping to demonstrate compliance. The compliance requirements will be incorporated into operation permits during the normal cycle of permit issuance or renewals. This process applies to both existing and new/modified sources and avoids the need to obtain a construction permit or to re-open an operation permit as a result of this rule revision.

For new and modified sources, the compliance certification process has the added advantage of avoiding the potential legal implications of federal enforceability of state-only requirements in a construction permit. Although this has never yet happened, this provision provides an additional level of legal comfort to sources.

- *Pilot Environmental Management System (EMS) Project.*

The rule revisions include a pilot test of environmental management systems as a permit-related compliance reporting option for demonstrating compliance with the benzene NR 445 control requirements for the iron foundry industry. Under this option, sources will be able to use some or all of their EMS reporting, recordkeeping and testing activities in place of some of the traditional compliance demonstration requirements included in operation permits. The intent is to reduce on-going administrative burdens. If successful, the Secretary may authorize the use of this provision by other source categories after reviewing an evaluation of the pilot project and conducting a public hearing.

The EMS provision is part of an on going Environmental Management Systems pilot that the Department is conducting in partnership with the Wisconsin Cast Metals Association. The proposed rule language is still under discussion among the partners in the EMS pilot.

Analysis of the Regulatory Burden through Workshops and Interviews

In collaboration with the Business Impact Working Group, two complementary analyses were undertaken to assess the impact of the proposed revisions. One was led by WMC and the other by the Wisconsin Department of Commerce Small Business Clean Air Assistance Program. In both cases, the Air Program assisted in preparing and presenting the background materials and survey instruments but did not participate in the business interviews or workshops in order to keep the participants' identity confidential.

WMC Workshops

Two, day-long, workshops were held in November 2001, one in Appleton, the other in Milwaukee. After an overview of the proposed revisions, participants completed a detailed "NR 445 Compliance 'Real-Cost' Estimate Work Sheet" to estimate their costs of NR 445 compliance under three scenarios: the current rules, the proposed revised listing of regulated substances without the streamlining revisions, and the revised listing with the streamlining revisions.

Nineteen companies completed the cost survey. Sixteen industrial sectors (SIC codes) were represented. Four foundries participated. All other industrial sectors had one participant. Size distribution ranged from 85 employees to 7,800 employees, with 12 companies at 500 or more employees. Thirteen are subject to federal hazardous air pollutant (MACT) standards. All but one currently has an air permit. The one company without a permit avoided regulation through implementing pollution prevention or waste minimization practices.

The "Real Cost" analysis includes the direct and indirect costs of compliance, including labor costs for upper management, supervisors, Environmental Health and Safety (EHS) staff and hourly workers, non-labor operating costs and capital costs related to compliance. The NR 445 regulatory process was mapped out and the tasks associated with each regulatory activity were set out. These activities can be classified into two broad categories: administrative and implementation activities.

The administrative category includes:

- Environmental Management: developing and maintaining the systems for record-keeping, reporting, training, tracking performance, staying current with regulations and technology.
- Search and Inquiry: determining the potential applicability of the revised list of NR 445 regulated substances.
- Emission Calculation: determining whether NR 445 emissions trigger regulatory thresholds for emission standards, inventory reporting, or permits.
- Planning for compliance: determining the preferred method for compliance and conducting the internal planning (including permit applications) necessary to implement the method

The implementation category includes:

- Implementing the compliance method: capital costs of implementation
- Administrative costs of compliance: monitoring emissions, record-keeping and reporting as required in a permit.

- Operation and Maintenance: operating and maintaining the modified facilities, equipment and control systems and managing residuals.
- *Interpreting the Responses*

There is a richness to the responses that is illustrative of the potential regulatory impacts and points to activities where the regulatory burden is likely to be higher. This information was extremely useful in designing a regulatory system to minimize the regulatory burden.

However, several caveats should be kept in mind in interpreting the workshop results. The workshops were held while the draft rules were still under development and some of the responses do not reflect the final proposal. This is particularly true for the implementation category where the highest compliance costs assumed that silica would be regulated, which is not being proposed.

The regulatory process has been designed to act as a series of filters with a number of alternative approaches to demonstrate that emissions don't exceed threshold levels, the first filter, or the emission standard, the second filter. In most cases, the respondents provided cost estimates assuming that they would not be able to "filter" out of the regulatory process. However, they also noted that there was a level of uncertainty in their responses. The implementation responses, in particular, were considerably speculative, given the uncertainty as to which chemicals might need to be reduced, the reduction method that would be selected and the capital costs associated with that method.

The cost estimates provided are the cost estimates for 19 manufacturers out of over 17,000 manufacturing establishments in Wisconsin. With the exception of the foundry industry, a single participant represented each industrial sector. The cost estimates are based on the professional judgment of respondents. There was a high degree of variance among the responses. Given the variability of the cost estimates within the survey and the small sample size, conclusions about average, median, range or total costs are not statistically supportable to extrapolate to expected costs for companies within an industrial sector or statewide.

- *The Results*

Due to the caveat about drawing conclusions on the costs of these rule revisions, this discussion is a qualitative summary of the workshop responses.

The regulatory impact of the rule varied tremendously among the respondents. About half of the respondents reported that there would be a relatively significant one-time cost associated with the revisions. Seven of the 19 respondents estimated their initial administrative costs to be at least 50% higher under the new rule than their current recurring NR 445 administrative costs. Five estimated their costs to be about twice as great. Firms that had invested more heavily in their environmental management system infrastructure appeared to have relatively lower incremental initial administrative costs. The one source that reported high costs associated with the current environmental management system estimated very small incremental increases associated with the rule revisions. Conversely, firms that had the highest incremental costs in the environmental management/search and inquiry categories were typically those with lower current costs in this category. The 8 firms that said that their environmental management costs were driven by "broader objectives associated with environmental management in general" had lower estimated NR 445 costs than those firms that said their EM costs were driven by NR 445 compliance.

Three sources reported high implementation costs but indicated that these costs were only likely if silica was regulated. The rule revision proposes a special study for silica and exempts emissions of silica from regulation.

All but three respondents expect benefits from the streamlining provisions. The streamlining provisions benefited companies differently. A third of the sources indicated that the streamlining provision would reduce their increased costs by more than a half; in other words, without the streamlining provisions, their costs to comply with the proposed revisions to the list of regulated substances would be two times greater. Three respondents reported that the streamlining proposals would be helpful in almost all of the areas in which they are proposed. Almost all respondents indicated that the compliance certification alternative to permits would reduce their administrative costs.

Four sources indicated that they had made significant investments in the past to not have HAPs in their production. They referred to this activity as reflective of their corporate culture and that the benefit of this past investment was an expectation that compliance with NR 445 revisions would be relatively low cost. Most sources said that their preferred compliance option was to take steps to avoid NR 445 regulation: 11 listed material substitution, 6 listed reducing their use of HAPs, and 12 listed changes to their physical structure (such as, raising stack heights).

Department of Commerce Small Business Clean Air Assistance Program Interviews

Staff of the Small Business Clean Air Act Assistance Program contacted 14 companies and conducted one-on-one interviews with eleven businesses. Three companies that were contacted were not interviewed since they found that they were not affected by the proposed revisions to NR 445. Each interviewee was provided with a short version of the revised NR 445 list that included those HAPs that were most likely to be emitted by their industry or industrial process. This was followed with either face-to-face meeting or telephone interviews. Except for one interview, the interviewer was the former Operation Permit Team Leader with the Bureau of Air Management who has extensive knowledge of the state hazardous air program.

The interviews were qualitative rather than quantitative and were directed at learning:

- how smaller companies manage environmental regulations
- what the regulatory impact of the rule revisions might be and how they would most likely respond
- what they saw as current regulatory hurdles, whether the proposed revisions would be helpful, and whether they had suggestions to further reduce the regulatory burden.

The eleven companies that participated in the interviews were drawn from major industrial sectors in the state and an emerging industry. They included:

- Wood products (4)
- Printing (3)
- Metal product coating/fabrication (2)
- Biotechnology (1)
- Vehicle maintenance and rework (1)

The size of the companies ranged from 10 to 500 employees, with 6 companies having fewer than 100 employees and two having over 400 employees. Nine of the 11 companies have an air permit, although none are classified as major sources, one has applied for a minor source air permit and 8 companies currently report to the Air Emissions Inventory. Three are regulated under NR 445. All three opted for

operational restrictions to avoid add-on controls. Another company limited its emissions to stay below NR 445 threshold levels.

- *Interpreting the Responses*

As is the case with the WMC-sponsored workshops, the sample size is small, 14 companies, and the responses should be interpreted as illustrative of the potential impacts. However, there was a high degree of consistency in the responses, particularly among those companies with fewer than 400 employees. Patterns emerged which suggest that some generalizations can be made.

- *The Results*

The largest companies have automated management systems for environmental regulations. The smaller ones do most of the work by hand. Several indicated they were thinking of automating their system, with one planning to move toward a formal Environmental Management System. Most of the companies rely on the Wisconsin Federation of Environmental Technologists, WMC, the DNR or word of mouth to inform them of regulatory changes.

All but the smallest company had reviewed the short list of chemicals. For most of them, the time spent to review the list was between 1 and 2 hours. The high was 15 hours by the Environmental and Safety manager of a company with 4 plants and hundreds of materials to review. With two exceptions, they did not anticipate significant additional recordkeeping or tracking as a result of the rule revision. If additional tracking or recordkeeping were necessary, it would only be for a few chemicals and they generally did not see this as a problem. For example, one firm said that they have few HAPs now and rarely have changes, so that it would be easy to review new materials for HAPs. Two firms indicated that it would require additional recordkeeping because they work with complex formulations or have “on demand” type jobs that use a wide variety of chemical products. They would probably need to either add an extra staff person or hire a consultant to set up a tracking system for them.

Five companies indicated that they had identified chemicals on the revised NR 445 lists that they used or emitted, but they either thought their emissions would be below threshold levels or they did not know the quantities of emissions. If they were affected, most would choose to eliminate or reduce HAP usage.

None of the interviewees would be able to take advantage of the Incidental Emitters provision. At the time of the interviews, the incidental emitter cut-off was proposed to be 1 ton/year of VOC or particulate emissions. As a direct result of these interviews, the cut-off was raised to 3 tons/year of volatile organic compounds and 5 tons/year of particulate matter. Most did not find prescriptive language regarding the search and inquiry, which was included in the rule at the time of the interviews, helpful. (The merit of including detailed rule language on search and inquiry was a topic of much discussion at several TAG meetings. The interview results confirmed the decision by the TAG not to include it.)

On the other hand, the compliance certification process would save time and money. The alternatives to BACT/LAER would be helpful if they emitted carcinogens; the additional stack thresholds were a good addition, particularly for future construction; and, the modeling off-ramps would be useful, if necessary. Several suggestions were made for assisting small businesses. These included: process or industry lists of chemicals, industry specific workshops with time for one-on-one assistance, and making the list of chemicals available in an electronic database.

Discussion of Workshop and Interview Findings

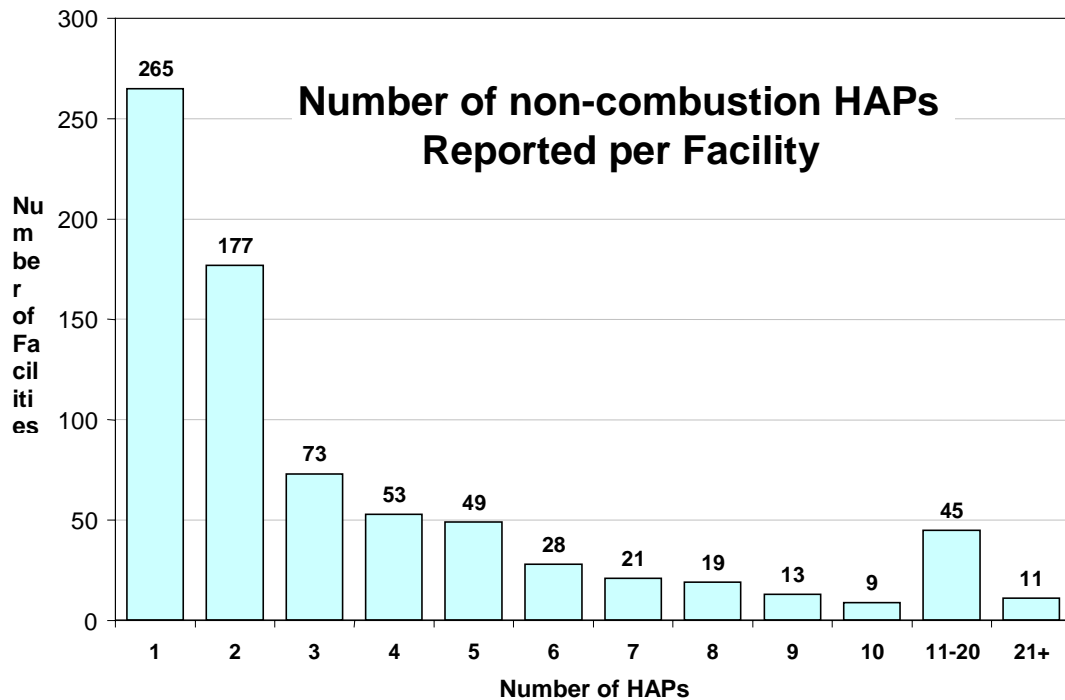
The results of the workshops and interviews confirmed that the initial process of identifying possible emissions, the first step in determining whether a source may be affected by NR 445 regulations, places a regulatory burden on sources, especially for sources that use many chemicals, work with complex formulations and frequently change products or processes. This confirmed the direction that the NR 445 TAG members and Air Program were taking to address the issue of regulatory burden: streamlining the search and inquiry process, providing additional methods for demonstrating that emissions do not exceed threshold levels, adding compliance options particularly for the carcinogens, and including a compliance certification process. The findings were instrumental in making the decisions to raise the cut-off in the incidental emitter concept and to drop the prescriptive rule language regarding the search and inquiry. In addition, the suggestions for assistance will form the basis for the rollout of the revised rule. The Department has already begun conversations with the Small Business Clean Air Assistance Program, the UW- SHWEC, WMC and other trade associations on the development of industry fact sheets, workshops, one-on-one technical assistance and electronic databases.

It should be noted that sources that use or create hazardous substances are subject to a number of federal environmental, health and safety regulations. Some of the more well known include the Occupational Health and Safety Act (OSHA), Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the Toxics Release Inventory (TRI) reporting requirements. In addition, companies are required to post or make available all of the material safety data sheets for products that they use or manufacture. Sources are also required to track and report their actual, annual emissions to the Wisconsin Air Emissions Inventory, if they exceed the reporting threshold levels.

The impact of the search and inquiry responsibility under the proposed revisions will vary from source to source depending in part on the number of hazardous pollutants they use and in part on what their current environmental, health and safety responsibilities are and how they manage those responsibilities. Firms that handle large numbers of hazardous substances, with complex formulations or with frequently changing products or processes are likely to have higher costs associated with managing their hazardous substances in an environmentally responsible manner. This was confirmed in the workshop and interview responses. Firms that have well developed management systems to track and comply with environmental, health and safety requirements, especially those with automated systems, should find the search and inquiry responsibility less burdensome than firms without systems in place. Again, the workshops and interviews confirmed this.

Over 750 of the 2000 facilities that annually report to the Air Emissions Inventory report emissions of hazardous air pollutants. The large majority of these report fewer than five hazardous air pollutants, excluding combustion-related HAPs. As the following graph shows, about a third of the 763 facilities reporting HAPs report only one hazardous air pollutant. Another quarter reported only two. Only eleven of the facilities reported more than 20 HAPs. Most of these were sewage treatment facilities and specialty coaters.

The low numbers of HAPs reported per facility is due to one of two reasons. First, most firms do not use many hazardous air pollutants. Second, a number of firms that use multiple hazardous air pollutants and that might be expected to emit larger numbers of HAPs, do not report any to the emissions inventory. Either their emissions are below reporting threshold levels or they have taken steps such as material substitution or pollution prevention to limit their emissions. The workshops and interviews confirmed that this was a preferred approach for most firms.



Total Number of Facilities Reporting HAPs: 763

Source: 2000 Air Emissions Inventory

Potential Controversies

The history of NR 445 has been marked by controversy. The rule was adopted after much controversy in 1988, challenged in court and upheld in 1990 and, in 1994, was revised to incorporate chronic non-cancer toxicity based limits following considerable controversy.

In undertaking a comprehensive revision to this rule, staff made a deliberate decision to conduct a very open, inclusive and deliberative process. This process, which has spanned 30 months, has been successful in resolving numerous issues and in striking a balance between providing public health protection and reducing the regulatory burdens. There continue to be inevitable differences of opinion on fundamental public policy issues, but there is general agreement among the Technical Advisory Group members on a number of potentially controversial issues, including:

- The concept of using risk-based threshold levels for carcinogens
- Limiting requirements for incidental emitters
- Due diligence/safe harbor/corrective action
- Protocol for listing substances in NR 445 and periodically updating the list
- Self-certification of compliance
- The interface between NR 445 and Section 112 of the Clean Air Act
- Alternative compliance options
- Accidental spills
- Asphalt Fume

However, the rule revision will continue to be controversial for the simple reason that there are fundamental public policy differences of opinion regarding the regulation of hazardous air pollutants by the state. On the one hand, many in industry argue that the proposed rule revisions will regulate too many hazardous air pollutants and that the state should not go beyond federal regulations. On the other hand, many in the environmental/public health community argue that the regulation does not go far enough. Some important public health issues are not addressed, in particular persistent bioaccumulative toxics and cumulative air toxics.

In addition to the fundamental differences regarding the scope of NR 445, issues that remain controversial include:

- Setting levels for risk-based thresholds for carcinogens
- Regulation of internal combustion compressed ignition engines (diesel generators)
- Regulation of respirable coal dust
- Listing silica and wood dust while special studies are conducted

The Public Involvement Process

A Technical Advisory Group (TAG) was established in February 2000. Although members were invited to serve on the group, it evolved into a self-selected group of involved stakeholders, some of who were formally invited, others who participated because of their interest and commitment. Between 35 and 40 participants regularly attended the 17, day-long meetings, with additional participants depending on the issues on the agenda. At the meetings, anyone who wished to speak was encouraged to do so. See Attachment 1 for a list of the regular attendees and Attachment 2 for information on the meetings and materials.

The formula for working through issues started with a presentation by staff of an initial proposal and questions/answers followed by an in-depth discussion of the issue at the next meeting, a revised proposal at the third meeting and continued revisions and discussion until either a general consensus developed or staff determined that continued discussion would not result in consensus, new information or insights. Working groups, often expanded to include non-TAG participants, were created to work on specific issues such as Modeling, Accidental Spills, Business Impacts and Public Health. In addition, numerous meetings were held with affected stakeholders on specific issues, such as asphalt fumes, diesel exhaust, coal dust, wood dust, and silica.

A concerted effort was also made to reach people not involved in the TAG. Detailed meeting notes and materials as well as working drafts of the proposed list of substances and the rule language were posted on the Internet. Over 50 presentations were made at workshops, trade association meetings, meetings, Small Business Environmental Council, the Clean Air Act Task Force, Wisconsin Rapids Air Issues Forum and numerous other venues. Attachment 3 lists these presentations and meetings. In addition to getting the word “out”, these efforts led to a lot of people contacting staff with questions, suggestions, comments and information.

The TAG and non-TAG efforts resulted in substantive contributions to the rule revisions. TAG participants suggested many of the concepts that are included in the rule revision – the modeling off-ramp, one of the modeling compliance demonstration alternatives for carcinogens, the due diligence/safe harbor concept. Others, such as the incidental emitters concept, were proposed by staff in direct response to concerns raised by TAG members. Staff proposed others, such as the 4th stack threshold level, after informal discussions with stakeholders. The Business Impact workshops and interviews provided valuable insights that helped shape the final product.

As a result of the intensive participation by the TAG members and the extensive outreach efforts, many issues that had the potential to be extremely controversial are likely to no longer be controversial or as controversial.

The Proposed List of Regulated Substances

In written comments and at the TAG meetings, WMC has stated its objection to the process of using third party lists that results in close to 700 listed substances in NR 445. In fact, the proposed revision will list 577 substances, not counting duplicate listings that are included so that users can easily find a chemical under one of its many names.

This issue has several components:

- The use of third party lists
- The listing process and the codification of this process
- The impact on the business community of so many regulated substances
- Future updates to the list of regulated hazardous air pollutants

The Use of Third Party Lists

The Department relies on third-party lists to provide the scientific basis for finding that a substance is a hazardous air contaminant. In 1990, the State Appeals Court upheld the Department's reliance on the work of national and international scientific and toxicological expertise.

The agencies that the Department relies on are highly respected for their work. The American Conference of Government Industrial Hygienists (ACGIH) is an organization recognized worldwide for its expertise in establishing acceptable exposure concentrations for workers in industrial settings. The Department relies on ACGIH for information on acute non-carcinogens. The International Agency for Research on Cancer (IARC) is an agency of the World Health Organization established to promote international collaboration on cancer research and to provide expert independent scientific opinion on environmental carcinogens. The National Toxicology Program (NTP) was established within the U.S. Department of Health and Human Services as a collaborative effort among the National Health Institutes to develop scientific information needed to better protect the American public from exposure to toxic chemicals. The Department relies on IARC and NTP for information on carcinogens. The U.S. Environmental Protection Agency has charged its Office of Research and Development and the National Center for Environmental Assessment to produce scientific assessments of the toxicity of hazardous air contaminants. These assessments are subjected to extensive internal and external peer reviews. The Department relies on this work for information on chronic non-carcinogens.

The Department does not have a staff of toxicologists to conduct independent research and believes that this would not be a wise use of state resources when there are highly qualified national and international agencies charged with this responsibility. Some states have many toxicologists on staff, perform independent reviews and regulate many more substances. Michigan, for example, reviews all of the chemicals that may be emitted by new or modified sources as part of their permitting process and, to date, has regulated over 880 hazardous air pollutants in their air permits. Texas reviews over 1900 hazardous air pollutants as part of its air permitting process.

The Listing Process

The department's process for determining whether or not to list a substance in NR 445 is a two-step process. The first step is to find that the substance is a hazardous air contaminant that may be listed in NR 445. The second step of the process is to determine whether a substance found to be a hazardous air contaminant should be regulated under NR 445 in order to provide adequate protection for public health or welfare.

In the first step, the Department, in consultation with the Department of Health and Family Services, reviewed the third party lists and determined that a substance is a hazardous air pollutant if it caused adverse health impacts due to inhalation and it met one or more of the following criteria.

- It was determined to be a HAP with acute non-cancer health effects if it has a threshold level established by the American Conference of Government Industrial Hygienists.
- It was determined to be a HAP with known carcinogenic effects if it is classified as human carcinogen by IARC and as a known human carcinogen by NTP.
- It was determined to be a HAP with probable carcinogenic health effects if it is classified as reasonably anticipated to be carcinogenic by IARC and by NTP. A substance that is classified as a human carcinogen by one agency and as reasonably anticipated to be carcinogenic by the other was determined to be a probable carcinogen.
- A substance is determined to be a HAP with chronic non-cancer health effects if it has a reference concentration established by the U.S. Environmental Protection Agency with an uncertainty factor of 300 or less.

Based on this review, a list of substances was developed that included 148 previously unlisted substances and 5 listed carcinogens that no longer met the criteria. As part of the process, the health basis for establishing the emissions standards was also reviewed for all currently listed substances. This resulted in considering more stringent standards for 125 acute non-cancer HAPs and 5 carcinogens and less stringent standards for 86 acute non-cancer HAPs.

The list of substances, developed in step 1, was then evaluated against a set of decision criteria and 43 were removed from the list, another 43 of the substances are being listed in Limited Applicability Tables and 11 are being listed but are not being regulated and instead special studies will be conducted (silica and wood dust listings). Attachment 4 shows the results of this process.

TAG members argued that this second step should be included in the rule. Department staff supports this suggestion and these criteria are being codified in the revised rule. This second step was also followed in developing the original NR 445 list but was not included in the rule. In addition, language is included in the rule that allows an affected source or interested party to submit new information and request that the Department reconsider its decision to list or not list a hazardous air contaminant in NR 445.

An argument that has been raised is that the Department should only list hazardous air contaminants if there is an actual exposure to them in Wisconsin. The Department's response to this argument is:

- The Department's responsibility is to protect public health now and in the future. Even if a hazardous air contaminant is not currently being emitted, it may be in the future. Products and processes are constantly changing. New industries are emerging and new companies are moving into the state. Listing the substance provides notice to the company before starting a new process or modifying an

existing process that it must consider how to use the substance so as not to create an adverse health impact.

- Emissions of hazardous air contaminants that are not currently regulated are not reported to the Department or the federal government. Consequently, there is very sparse information as to whether there is an actual exposure to them in Wisconsin. If this were the test, the alternative would be to require sources to report all emissions to the department. This would be even more burdensome since there would be no limit to the number or levels of substances to report.

The Impact on the Business Community

Industry's primary objection to the number of chemicals listed in NR 445 is the burden this places on all facilities in Wisconsin to undertake an exhaustive search of their operations for each of the listed chemicals. Three measures are proposed to reduce and place bounds on a source's responsibilities, while continuing to protect public health. These measures focus attention on the most likely sources of emissions.

- *Incidental Emitters.*

This measure substantially narrows the regulatory impact for most businesses in Wisconsin. Most non-manufacturers and manufacturers that emit less than 3 tons of VOCs or 5 tons of particulate matter need only review their operations for specific processes (such as chrome electroplating) and a shorter list of 78 chemicals of special concern. It is estimated that 99% of all Wisconsin establishments and about 90% of manufacturing establishments will benefit from this measure.

- *Due Diligence and Safe Harbor.*

This measure substantially alleviates a facility's responsibility by placing bounds on the search process and limiting its legal liability. A facility is deemed to be in compliance with NR 445 and other related regulations if it exercises due diligence by investigating and meeting regulatory requirements for those hazardous air contaminants that it reasonably expects may be emitted.

- *Backstop Language.*

This measure ensures that public health will be protected by requiring corrective action in a timely manner if it is later determined that either an incidental emitter or a facility exercising due diligence has emissions that exceed threshold levels.

Future Updates

Industry is concerned that the listing process will continue to result in large numbers of new substances being added to NR 445 in the future. In addition to the number of hazardous air contaminants added to the list, they are concerned about the regulatory impacts if the list is frequently revised. The environmental/public health community argues that the rule needs to be updated on a regular basis in order to protect public health and that the fifteen years it has taken the Department to update the current list is an unreasonably long time. They raised this to then-Secretary Meyer as one of their more critical issues.

Current NR 445 directs the department to monitor changes in the classifications of substances and to prepare rule modifications as necessary. However, it does not include a timetable for updating the list of

regulated hazardous air contaminants. This proposed rule revision is the first comprehensive update to NR 445 since it was adopted in 1988.

The rule revision proposes a review and updating process that represents a compromise. No less frequently than every three years, the Department is required to develop a “candidate” list of hazardous air pollutants. This is equivalent to step one of the listing process. No later than every six years, the Department is required to analyze the candidate list against the listing criteria and make recommendations on rule revisions. This is the equivalent of step two of the process. Both steps include consultation with the Department of Health and Family Services and a report to the Natural Resources Board.

This two-phase process provides industry and the public with regularly updated information on substances that may be regulated as hazardous air contaminants, allows the department to take immediate action if one or more particular substances warrant it, and provides industry with advance notification and up to 6 years between rule revisions. As a practical matter, more frequent and regular updates should include fewer substances than the current rule revision.

Interface Between State and Federal Air Toxics Regulations

Two issues have been raised regarding state and federal air toxics regulations. The first relates to whether Wisconsin should have a state air toxics program at all instead of just relying on the federal program. The second relates to how the state and federal programs interface with each other.

Differences between the state and federal air toxics regulations

The federal air toxics program was fundamentally re-worked in the Clean Air Act Amendments of 1990, after more than a decade of minimal progress under the old program. Section 112 of the Act lists 188 hazardous air pollutants and establishes a two-phase regulatory strategy. In the first phase, the Environmental Protection Agency is required to adopt technology standards for about 170 listed source categories. These are called Maximum Achievable Control Technology (MACT) standards and are based on the average of the best-demonstrated control technology or practices used by regulated industry. In the second phase, EPA is required to establish health-based, or residual risk, standards for those source categories for which EPA determines that public health risks remain after the adoption of the technology standards. EPA is nearing completion of the first phase and has just begun to study the residual risk for the first-adopted MACT standards.

NR 445 is more protective of public health than the federal program in several important respects. First, the federal program covers 188 hazardous air pollutants. Current NR 445 covers about 440 hazardous air pollutants and another 148 are proposed. Most of the Clean Air Act HAPs are listed in NR 445. Examples of state-only HAPs are ammonia and stoddard solvents.

Second, the federal MACT standards only apply to certain sources of emissions. The federal MACT standards are established for about 170 source categories, such as printing and publishing. For the most part, only major sources are subject to the MACT standard. A major source is defined as a facility that may emit 10 tons per year of any single Clean Air Act HAP, or 25 tons per year of any combination of HAPs. In a few cases, the standards apply to facilities with lower levels of emissions, such as the dry cleaning MACT. The federal MACT standards generally apply to specific emissions units, operations or activities within a facility, not to all sources of HAP emissions at a facility. Under NR 445, any source with emissions exceeding the threshold amounts must meet emission standards.

Third, the MACT standards are technology-based, while NR 445 is primarily health-based.

NR 445 provides public health protection that is not provided under the federal program. It protects public health from hazardous air pollutants that are not regulated under the Clean Air Act and from HAP emissions from sources and from emission units, operations and practices that are not regulated by the MACT standard. The threshold levels are health-based rather than based on tons/year of HAPs emitted, and the non-cancer standards are health-based, as are the newly proposed compliance options for carcinogens.

Interface between the state and federal air toxics regulations

Under state statutes, if an emission standard for a hazardous air contaminant is promulgated under Section 112 of the Clean Air Act, the Department is directed to promulgate by rule a similar standard. However, the state standard may not be more restrictive in terms of emission limitations than the federal standard (s. 285.27(2), Wis. Stat.)

The revised rules more clearly articulate the interface between Section 112 and NR 445 than in the current rule. They clarify that NR 445 does not apply to NR 445 hazardous air pollutants emitted by an emissions unit, operations or activities that are regulated by an emission standard promulgated under Section 112.

NR 445 applies to emission sources that are not regulated by a federal MACT standard. These include:

- Facilities that are not covered by a federal MACT source category
- Facilities that are covered by a federal MACT source category but are not major sources, including those that take limits to avoid major source status.
- Emissions units, operations or activities at a facility subject to a MACT standard, but which are not regulated by the MACT standard.

NR 445 applies to hazardous air pollutants that are not regulated by a MACT standard. For purposes of clarification, the rule revisions propose to define hazardous air pollutants “that are regulated by an emission standard under Section 112” to mean the substances that are regulated by name in the MACT standard as well as those that are regulated by virtue of regulation of another substance as a surrogate or by virtue of regulation of a species or category of hazardous air pollutants. The reason for including this definition is to clarify that emissions of hazardous air pollutants, whether federal or state, that are, in practice, controlled by the MACT standard will not be additionally regulated by NR 445.

Some MACT standards list the pollutants that are regulated by name but many do not. Instead, they may regulate a category of HAPs. For example, they may regulate volatile organic HAPs. In this case, NR 445 volatile organic HAPs that are emitted by the emission sources regulated by the MACT standard would not be subject to NR 445 regulations. However, other NR 445 substances that are not volatile organic HAPs, such as particulate matter HAPs, would be subject to NR 445.

On rare occasions, the standard may name only one HAP although the MACT control technology will, in practice, control emissions of many others. Only one HAP is named because, for compliance monitoring and reporting purposes, this is all that is necessary. In this case, the NR 445 substances that are, in effect, regulated by the MACT standard would not be subject to NR 445 regulations. Again, emissions of NR 445 substances that are not controlled by the MACT control technology or operational practices would be subject to NR 445.

The proposed rule revisions eliminate the “anti-backsliding” provision in the current rule. This required sources to continue to comply with NR 445 if they were doing so prior to the promulgation of a Section 112 standard. The proposed deletion is necessary to avoid the significant administrative complication that would be created for both regulated sources and the Department of having to track effective dates for each individual hazardous air pollutants in the existing and proposed rule and for each industrial emissions unit in the 170 industrial source categories regulated under the federal program today.

Furthermore, it is expected that all of the federal standards for the industrial source categories will be promulgated within the 36-month schedule for sources to certify compliance with new state standards and requirements. This will allow for a much better understanding of how the state and federal programs relate to each other, and with the clarity provided for state applicability, provide for implementation of both programs without unnecessary overlap

Regulation of Persistent Bioaccumulative Toxics and Emissions from Multiple Sources

In written comments and at the TAG meetings, environmentalists and public health officials have argued that certain air emissions are persistent bioaccumulative toxics that are hazardous to the environment and human health and should also be regulated under NR 445.

They have also argued that the cumulative impact of emissions from multiple sources is a public health concern that NR 445 does not address. From the public health perspective, this is of particular concern in areas with multiple sources of similar hazardous air contaminants and in more urbanized areas where there are many different emission sources.

The Department acknowledges both of these concerns. However, the Department made the policy decision at the start of the NR 445 revision process to limit the scope of the revision to updating and streamlining the rule within its existing framework and not to make fundamental policy changes.

The reason for this decision was two-fold. First, the primary objective was to update the list of hazardous air contaminants as soon as possible. Updating and streamlining alone were major tasks and likely to be controversial in themselves. Undertaking major new policy initiatives would slow down the process significantly and could result in not achieving the primary objective.

Second, NR 445 is not the best vehicle for addressing these complex issues. The Department is moving forward with separate rulemaking to regulate the atmospheric deposition of mercury. The approach being taken is very different from the approach in NR 445 because of the nature of the problem – regional transport and bioaccumulation versus localized impact and inhalation. The issue of cumulative impacts and localized areas of concern is broader than emissions from stationary sources. More study and thought is needed to determine the best way to reduce risks to public health in these situations.

The Levels at which Risk-Based Thresholds Are Set

The basis for establishing threshold levels for carcinogens has been changed in the proposed revisions. The proposed revisions set the thresholds such that emission concentrations off property will not exceed a 1 in 100,000-risk level. Going to risk-based thresholds allows for consideration of the dispersion characteristics of different stack heights. Under the current rule, there is a single non-risk based threshold level that applies to the total emissions of a carcinogen from the entire facility. The proposed rule establishes four stack threshold concentration levels for each carcinogen, with each level being protective to the 1 in 100,000 risk level. These are the same four stack categories as established for the non-

carcinogens. The threshold level applies to all emissions from stacks within the stack category. For about 75% of the carcinogens, the threshold concentrations in the shortest stack category, stacks below 25 feet, are lowered by a factor of two or more from current thresholds. For about 40 of the carcinogens, the threshold levels in the over 75-foot stack categories are raised by a factor of two or more from current thresholds.

The TAG supported the risk-based concept for establishing thresholds and compliance options for carcinogens. From an environmental/public health perspective, it provides a clearer, scientifically based and health-protective method for setting threshold levels. From the regulated community's perspective, it provides the basis for additional compliance options as alternatives to control requirements.

However, there are a number of potential controversies within the overall risk-based framework. The primary ones include:

- Setting threshold risk levels at 1 in 100,000 using conservative modeling assumptions
- Setting threshold concentration levels for substances which do not have an established unit risk factor

Setting Threshold Risk Levels at 1 in 100,000 Using Conservative Modeling Assumptions.

The threshold levels in NR 445 serve a screening function. Sources that emit NR 445 HAPs above a threshold amount must demonstrate compliance with the emission standards. The thresholds are established using atmospheric deposition modeling for generic stack heights, stack parameters and sites, the potency of the substance and, in the case of carcinogens, the risk level. Because they serve as the initial screen, thresholds are set using conservative modeling assumptions. A source whose emissions exceed the table threshold values has the opportunity to demonstrate through modeling that its specific source or site characteristics are such that its emissions do not result in an off property concentration that would result in a risk greater than 1 in 100,000.

Two opposing arguments were raised during the TAG discussions of setting the risk-based thresholds for carcinogens. Environmentalists and public health officials argued that the threshold concentrations should be set at a 1 in a million risk level, rather than 1 in 100,000, in order to be protective of public health. Industry representatives argued that the modeling assumptions were too conservative, leading to overly protective threshold levels and very low threshold levels, particularly at the shorter stack heights.

Unlike non-carcinogens, there is no "safe" level of exposure. The decision regarding the appropriate level at which to establish threshold concentrations is a policy decision. Departmental guidance for managing toxic substances is that action would normally be required at risk levels in the range of 1 in 100,000 to 1 in a million. This is defined as the risk of one additional cancer case occurring for every 100,000 (or one million) persons assuming exposure over a lifetime.

The TAG and Modeling Subgroup discussed these issues over several months. After considering all of the input, Department staff made the decision to propose a 1 in 100,000-risk level using conservative modeling assumptions as a threshold level that provided adequate protection of public health. The Department recognizes that some of the threshold concentration levels are very low, particularly for stacks that are less than 25 feet high. The reason that these threshold levels are so low is that these carcinogens are extremely hazardous to human health.

Setting Threshold Level Concentrations for Substances with No Established Unit Risk Factor

The proposed threshold levels are a function of the emission concentrations determined through modeling, the 1 in 100,000 risk level and the substance's unit risk factor, or potency. Unit risk factors have not been established for all known or probable carcinogens, including 66 substances in the proposed NR 445. Staff proposed a default unit risk factor that was calculated based on a statistical analysis of the 131 carcinogens listed in NR 445 that had unit risk values and setting the default as the median value. This would mean that 50% of the time, the substance was likely to be more hazardous than the default value and 50% of the time, less hazardous. Industry has argued that this approach results in threshold levels for shorter stack heights that are too low and is overly conservative. Staff believes that there is a risk on either side—of being overly conservative and of being under-protective – and is open to suggestions of other methodologies to establish a default unit risk factor.

Regulation of Internal Combustion Compressed Ignition Engines (diesel generators)

The proposal to regulate stationary source diesel generators has generated considerable controversy. The major argument is that state regulation is not needed in light of current and anticipated federal programs to address diesel emissions through cleaner fuels and engine technology. The groups that have been particularly vocal on this issue include engine manufacturers and distributors, transportation construction interests, and WMC. The utility sector, which is likely to be the most impacted by the control requirements, has not raised objections.

This section explains the rationale for proposing to regulate diesel exhaust particulate and describes the proposed regulatory approach of setting performance standards rather than emission standards for existing sources.

Rationale for Regulating Diesel Exhaust Particulate Emissions.

As explained earlier, the process for determining whether to list a substance in NR 445 is a two-step process. First, a determination is made that the substance is a hazardous air contaminant. Secondly, a determination is made that the substance should be listed in NR 445 to provide public health protection.

- *Determination that Diesel Exhaust Particulate is a Hazardous Air Contaminant*

Under the current rule, diesel is one of the fuels included in the definition of fossil fuels that are exempt from NR 445 requirements. In the 1980's, diesel exhaust was not identified as having either cancer or non-cancer health effects and was not listed in the original rule. In 1994, diesel exhaust particulate was listed in NR 445 for its chronic non-cancer health effects but the exemption was not removed because the staff analysis found that emissions were unlikely to exceed the reference concentration for diesel particulate.

Diesel exhaust particulate is now classified as a probable carcinogen by both the International Agency for Research on Cancer and the National Toxicology Program. This classification by both agencies meets the criteria in the first step for listing in NR 445 -- the finding that the substance is a hazardous air contaminant that may be listed in NR 445.

The health-related controversy centers on the degree of risk associated with diesel exhaust particulate and not on whether or not it poses a cancer risk. The U.S. Environmental Protection Agency has not yet established a unit risk factor for diesel exhaust emissions. The California Air Resources Board has, but

there remains considerable controversy over the risk factor established. Numerous studies indicate that there are increased lung cancer risks associated with diesel emissions. One factor that contributes to the adverse health impacts is that most diesel particulate is in the inhalable particle range (10 microns in diameter), with the majority of the mass less than 2.5 microns in diameter. Fine particulate matter penetrates into the deepest regions of the lungs and poses the greatest threat to human health.

- *Determination that Regulation Under NR 445 is Necessary to Provide Public Health Protection.*

The second step in the NR 445 listing process is the evaluation of the hazardous air contaminant against a set of criteria that includes whether other regulations provide adequate public health protection from an air toxics perspective. Diesel generators must meet state and federal emission limits for stationary sources. The most limiting of these for diesel generators are the emission limits necessary to protect the National Ambient Air Quality Standards (NAAQS) for nitrogen oxides and particulate matter. Under these regulations, new "major" air pollution sources must install best available control technology. Diesel generators seldom, if ever, have particulate matter emissions exceeding the major source applicability thresholds and therefore are not required to install emission control technologies to reduce their emissions. Staff reviewed the permits issued to over 200 diesel generators in 1999 and 2000 and found that none required the installation of control technologies. Commercially available add-on control technologies can significantly reduce particulate emissions, from between 70 to 95 percent in combination with lower sulfur fuels.

The principal argument against state regulation of diesel generators is that current and anticipated federal diesel engine and fuel standards will address diesel emissions and that Wisconsin's air program should be consistent with the national efforts. There are several reasons why staff has concluded that these federal regulations are not adequate to protect against the cancer health risk.

The federal standards for emissions from both on-road and off-road diesel engines have focused on nitrogen oxide emissions and their contribution to ozone formation rather than on particulate emissions and their contribution to lung cancer risks. Federal emission standards for diesel engines, the Tier 2 and Tier 3 standards, set emission rates for both nitrogen oxides and particulate matter. However, some of the control strategies used to set these standards acknowledge that reducing nitrogen oxide emissions in these engines can actually cause an increase in particulate emissions.

This is characterized as a "NO_x vs. PM" trade off and was considered in setting the Tier 2 and 3 emissions standards. This results in establishing Tier 3 particulate matter emission rates that are considerably higher than what can be achieved with currently commercially available add-on control technologies. US EPA clearly states in their October 2001 Staff Technical Paper for Nonroad Diesel Emission Standards, "The lack of restrictive Tier 3 PM standards makes it directionally easier for manufacturers to meet the relatively more restrictive NO_x+NMHC standard by changing the balance of the NO_x vs. PM trade-off from the Tier 2 engine designs." Therefore, it has been determined that Tier 3 particulate emission standards do not represent, nor are intended to represent a level which reflects best available control technology for particulates.

In addition to the primary objective being NO_x emission reductions rather than PM emission reductions, the federal engine standards apply to the manufacture of new engines, not to the use of existing engines. Diesel generators have very low turnover rates. They are reliable sturdy producers of power that do not need frequent replacement. Reliance on federal new engine standards would do little to reduce emissions from the current stock of generators. Unlike cars, a few years of patience would not result in a consumer-driven improvement in air emissions.

Proposal for a Performance Based Standard.

The Department is proposing a performance-based standard for existing sources instead of an emission standard, which in this case would be best available control technology (BACT). This approach is more efficient in cases where the emission source, operational characteristics and available control options are very similar, as is the case with diesel generators. It has the advantage of being simpler and more straightforward and provides more certainty to sources. The decision to set a performance-based standard rather than an emission standard has not been controversial.

Briefly, the proposal sets a performance standard for internal combustion compressed ignition engines (ICCE) that combust fuel oil. The standard applies to non-emergency stationary ICCE engines over 100 horsepower. External combustion units, such as industrial boilers, very small engines, and engines used to provide essential services are exempted from the proposed standard.

The performance standard has three levels:

- A fuel use requirement for all affected engines
- An emission rate for existing stationary engines and a BACT standard for new/modified engines combusting more than 40,000 gallons/ year
- BACT for engine testing facilities combusting more than 40,000 gallons/ year

The proposal is the product of numerous TAG meetings and stakeholder meetings. Although the recommendation to regulate diesel emissions will continue to be controversial, many of the issues related to the specifics of the proposed performance standard have largely been resolved. These include:

- The requirement to use on-road diesel fuel, which is readily available, rather than to use a fuel specified in terms of future federal fuel standards.
- Limiting the applicability to stationary sources and excluding portable sources from control requirements.
- Clarifying that individual engines tested in an engine testing facility are not subject to the performance standard. Instead, the BACT standard applies to the testing facility.
- Exempting essential services from the performance standards.
- Limiting reporting and compliance requirements for existing sources to self-certification in lieu of permits.
- Accepting 3rd party certification (US EPA, CARB) in lieu of requiring emission testing.

Concern has been voiced over the cost of retrofitting existing engines. The Department's research of currently available retrofit technology has found a range of costs depending on the technology used and the size of the engine. A range of \$4 to \$50 per horsepower annualized cost has been estimated by the California Air Resources Board and the Manufacturers of Emissions Control Association.

Listing of Silica and Wood Dust

The rule revisions propose listing silica and wood dust but exempting them from regulation until such time as additional follow up work is completed. The proposal directs the Department to conduct studies of the emissions of these substances, including the sources and amounts of emissions and alternative strategies for minimizing public health risks. Many complex questions need to be answered. Department staff decided that rather than addressing these during the rule revision process, it would be wiser to establish special studies that would be conducted after the current rule revision process was concluded. The results of the follow up work can be included in the next round of rule revisions.

The proposed listing of silica has generated considerable interest on the part of industry and the environmental communities. Early in the rule revision process, the Department received over 30 petitions from concerned citizens urging it to regulate silica. In response to the petitions, the department said that it was planning to list silica but not to include regulatory requirements and instead planned to conduct a special study following the NR 445 rule revision.

Wood dust is emitted by a wide diversity of sources, from loggers to users of powdered wood dust. For some source categories, an existing regulation may provide adequate public health protection from a toxics perspective; for other source categories, there may be no other regulations or the regulations that apply may not provide adequate health protection. Given the large number of source categories, the Department is proposing to exempt wood dust from regulation and to conduct a special study.

The industrial community supports the proposed special studies but argues that silica and wood dust should not be listed. The listing protocol includes the need for additional information as one of the criteria that the department will consider in determining whether or not to list a substance. By establishing, in the revised rule, special studies for both these substances, the department acknowledges the need for additional information and thus, they argue, these substances should not be listed.

The Department proposes to list, exempt from regulation on an interim basis, and study both substances. This is what it committed to do in its responses to the petitions on regulating silica emissions. Based on that commitment and understanding, the petitioners have accepted this proposal. There is also a precedent for this approach in the special studies of chloroform and formaldehyde established when the current rule was promulgated in 1988.

The proposed rule directs staff to consult with affected industry, public health officials and other interested parties in evaluating the sources and amounts of emissions and alternative strategies for minimizing public health. It further directs that a progress report be submitted to the Natural Resources Board within two years.

This approach has no regulatory impact. Nor does it pre-judge the outcome of the studies. Based on the evaluations, the studies may recommend regulating emissions of these substances, may recommend regulations for certain types of sources and other approaches for other sources, may recommend de-listing the substance because other regulations are adequate, or may recommend a new and innovative approach to minimizing the public health risks.

Regulation of Respirable Coal Dust

Respirable coal dust is proposed to be listed in NR 445 for its acute non-cancer health effects. The proposed emission standard for respirable coal dust is 21.6 ug/M3 (over a 24 hour averaging time) for bituminous, sub-bituminous and lignite coal. It is 9.6 ug/M3 for anthracite coal, which is rarely used in Wisconsin. At this level, emission concentrations off property should not result in acute non-cancer health effects for the general population.

Coal dust is currently regulated as a fugitive dust under ch. NR 415, Control of Particulate Emissions. An analysis of NR 415 regulations was conducted to assess whether NR 415 provides adequate public health protection from an air toxics perspective. Staff concluded that it does not. Industry argues that additional information is needed to make that determination and for that reason coal dust should not be listed. Instead, the rule should require a special study, similar to the studies of silica and wood dust emissions.

The rule revisions propose three additional compliance demonstration alternatives specifically for coal dust in recognition that managing emissions from transporting, handling and storing coal is fundamentally different from managing emissions from a stack.

Evaluation of Ch. NR 415

The staff analysis of Ch. NR 415 concluded that it does not provide a regulatory framework to assure that the public would be adequately protected from the acute non-cancer health effects of respirable coal dust. The reasons include:

- NR 415 does not establish emission limits that could be compared to the NR 445 emission standard for coal dust to evaluate the adequacy of public health protection provided. NR 415 prohibits sources from emitting particulate matter that would substantially contribute to exceeding the ambient air quality standard for total suspended particulate matter. This is an air quality standard, similar to the ozone standard, rather than an emission standard that limits emissions from a particular source, such as VOC or NO_x emission standards. It is not set to provide public health protection from specific hazardous air contaminants. Many substances listed in NR 445 are particulate matter but they are regulated as hazardous air pollutants with pollutant specific emissions standards that reflect their relative toxicity.
- NR 415 does not set a minimum performance standard for dust mitigation practices that could be evaluated to determine the adequacy of public health protection provided for respirable coal dust. NR 415 requires sources that emit particulate matter to take precautions to prevent the particulate matter from becoming airborne but does not prescribe minimum management standards or requirements. Facilities with coal piles have developed fugitive dust control plans. The practices vary from facility to facility but can include adding water or dust suppression agents, unloading rail cars in enclosed facilities that may also have baghouses to capture fugitive dusts, enclosed conveyor belts, tire washing to reduce coal dust from traffic in and out of the coal pile area and even, at the MG&E facility in Madison, a wall around the coal pile.
- The correction of problems related to citizen complaints of visible coal dust emissions (nuisance problems) and the absence of health-related complaints is not a sufficient basis to conclude that NR 415 provides adequate protection of public health. There have been citizen complaints about visible coal dust, such as coal dust settling on boats in a nearby marina. In these cases, the department has worked with the facility to implement additional management practices. However, the coal dust that is visible and leads to nuisance complaints consists of the larger particles of coal dust. The finer particles, those that lodge deep in the lungs when inhaled and are the subject of NR 445, are not visible.
- Department staff attempted to evaluate the adequacy of NR 415 to meet the NR 445 standards by examining ambient air monitoring data. There is a very limited amount of PM 10 monitoring data near coal handling facilities...only one site in the state. (PM10 is respirable dust size.) This site is on the roof of a three-story building across the street from a coal handling facility. It is not well sited for evaluating the facility's coal dust emissions, which was not its purpose. Nevertheless, the Department felt that reviewing the monitoring data from this site might be directionally informative. The results found that several samples from the site indicated that the proposed standard could be exceeded off the source's property.

For these reasons, the Department has concluded that NR 415 does not provide the regulatory framework for assuring that public health will be adequately protected from emissions of respirable coal dust.

Compliance Demonstration Alternatives

Although NR 415 does not provide the regulatory framework to assure that facilities are managing their coal dust such that their emissions do not pose a public health problem, there may well be individual facilities that are. Others may need to augment their management practices under this proposal.

In recognition of the fact that the management of coal dust emissions is fundamentally different from the management of the traditional stack emissions, the rule revisions include three alternative methods for demonstrating compliance. These are in addition to the option, available to all sources of acute, non-cancer HAPs, of a source-specific modeling demonstration. These three options are:

- A source specific ambient air monitoring demonstration
- A industry sector or area specific ambient monitoring demonstration
- A variance similar to the variance available to sources of emissions of substances with chronic non-cancer health effects.

The Department is continuing to work with affected stakeholders in developing the guidance for these options.

Other Less Controversial Issues

The issues discussed above are those that are believed will generate the most controversy. Throughout the 30-month rule development process, a wide range of issues have been raised, discussed and for the most part resolved. However, elements of these issues may surface in public comments. The following is a brief synopsis of some of these:

Alternative Compliance Options to BACT/LAER for Carcinogens

The rule revisions allow sources that are currently required to meet the BACT/LAER technology standard to demonstrate that their emissions do not exceed the risk based threshold or that they meet one of the alternative compliance demonstration options. They would then no longer need to comply with the BACT/LAER requirement. This may result in higher emissions.

Compliance Certification as an Alternative to Revising Operation Permits or Obtaining Construction Permits

With the exception of BACT/LAER determinations, which will continue to require Department approval, sources may self-certify that they comply with NR 445 standards. This precludes the need for existing sources to re-open operation permits prior to their normal renewal and for new/modified sources to obtain a construction permit. In all cases, the NR 445 requirements will eventually be included in the operation permit.

This process places greater reliance on sources to make correct compliance determinations, with the potential for public exposure to unhealthy emissions if mistakes are made. It also has the practical effect of delaying the opportunity for public comment. In practice, the department believes that this will result in greater overall public health protection in a timelier manner than relying on the permitting process, which is facing a large backlog.

Indoor Fugitive Emissions

Public health officials may argue that the current exemption for indoor fugitive emissions for non-carcinogens should be made consistent with that for carcinogens. This would require a showing that OSHA standards were met. This issue was raised at a TAG meeting. Department staff believes that most of the concerns can be met through guidance.

Accidental Spills

A subgroup was established to address issues relating to the notification requirements for accidental air releases. Membership included TAG members and members of the original NR 706 advisory group. Ch. NR 706 sets forth the hazardous substance discharge notification and source confirmation requirements. The charge to the group was to advise the Department on consolidating the spill notification requirements into one rule and on clarifying the notification requirements without changing the already existing requirements contained in NR 706.

After several meetings, the Department concluded that this was becoming a more difficult and complex task than had been anticipated and that consensus was unlikely to be reached. Department staff decided not to revise either rule, but to undertake additional outreach with stakeholders on hazardous substance spill reporting, especially as it related to air releases. The Department's Spill Team Leader met with the TAG and clarified that notification is required when an accidental spill is determined by the facility to involve a hazardous substance and to be a threat to public health, safety, welfare or the environment. This issue is no longer expected to be controversial.

Asphalt Fume

Asphalt fume was initially proposed to be added to the list of regulated substances for its acute non-cancer health effects. Department staff met with members of the Wisconsin Transportation Builders Association, the Wisconsin Asphalt Paving Association, the Asphalt Institute and the National Asphalt Pavement Association. Subsequent to the initial draft NR 445 List, the Environmental Protection Agency issued an assessment report on hot mix asphalt plant emissions that provided detailed new information on the constituents of asphalt fume, most of which are also regulated under NR 445. After evaluating the information received from industry, an on-site visit to a large asphalt plant and the EPA Assessment Report, the Department concluded that regulating asphalt fume in addition to regulating the specific chemicals and compounds that make up the fume would provide for little additional environmental benefit. Thus, the decision was made to not list asphalt fume in NR 445 but instead to use the 51 specific standards for 35 chemicals and compounds that make up the asphalt fume. The decision to regulate the individual constituents rather than the entire mixture may generate comments related to the additive or synergistic effects.

Environmental Analysis

The proposed rule revisions have been reviewed under WEPA and it has been determined that this is a Type III action under NR 150.03(6)(b), Wis. Adm. Code. The revisions are an update to an existing rule and the only anticipated environmental effects are the reduction of toxic releases to the environment. This Type III action requires notification under NR 150.02(1)(b), but does not require other WEPA related notification.

Small Business Analysis

The Small Business Analysis was conducted as part of the Business Impact Analysis described in the Regulatory Impact Section. This included interviews with small businesses conducted by the Department of Commerce Small Business Clean Air Assistance Program. Several measures are included in the rule revision that will substantially reduce the regulatory impact for most small businesses. These include the incidental emitters and the due diligence/safe harbor provisions. Small businesses that need to reduce or limit their emissions will benefit from other measures, such as the compliance certification process.

Background Information

Attachment 5, Understanding Wisconsin's Hazardous Air Pollutant Rules and Requirements, was prepared as a background document for the NR 445 TAG to help them understand the current NR 445 and related rules and the regulatory process.

Attachment 6, The Impact of the Current NR 445 on Wisconsin's Hazardous Air Emissions, is a review of emission reductions achieved through the current NR 445 regulations.

LIST OF ATTACHMENTS TO BACKGROUND MEMO

1. Participants in the NR 445 Technical Advisory Group
2. TAG meeting materials and presentations
3. Outreach Presentations and sub-group meetings for NR 445 Rule Revision
4. Application of Decision Criteria for Listing in Proposed Ch. NR 445
5. Understanding Wisconsin's Hazardous Air Pollutant Rules and Requirements, a primer prepared for the layperson that describes the current hazardous air pollutant program.
6. The Impact of the Current NR 445 Regulation on Wisconsin's Hazardous Air Emissions, a review of emission reductions achieved through the current regulations.